



# AFRICA SECURITY BRIEF

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## Building Africa's Airlift Capacity: A Strategy for Enhancing Military Effectiveness

BY BIRAME DIOP, DAVID M. PEYTON, AND GENE MCCONVILLE

- ◆ African states' ability to respond to violent conflict, transnational threats, natural disasters, and other security challenges is severely constrained by limited airlift capacity.
- ◆ Like multilateral institutions elsewhere, the African Union and Africa's Regional Economic Communities should look to partnerships and resource-pooling arrangements to leverage airlift capabilities.
- ◆ In the near term, large-scale African peacekeeping and humanitarian operations will rely on a combination of airlift support from "anchor states" and external partners, the mobilization of which can be streamlined by creating strategic airlift framework agreements.

### HIGHLIGHTS

In April 2012, the Economic Community of West African States (ECOWAS) declared its readiness to deploy 3,000 troops to northern Mali in response to seizures of territory by Tuareg separatists and Islamist militias. Left unanswered was the question of how ECOWAS would transport these troops and their equipment to Mali. Only airlift resources would be able to deliver personnel and heavy equipment into the area of operations (AO) in a timely manner, provide operational mobility within the AO against dispersed and heavily armed irregular forces, monitor a geographic area larger than France, and sustain operations for months or years. The inability to respond to these challenges to territorial control, in turn, further emboldens such separatists and other spoilers.

Similar challenges are faced in other inaccessible contexts of instability in Africa, including Somalia, the Democratic Republic of the Congo (DRC), and Darfur,

Sudan, where poor roads and rugged terrain make convoys slow, ineffective, and vulnerable to landmines or ambush. In certain cases, the government or rebel fighters may deny peacekeepers and aid workers access to land-based infrastructure, making air transport the only viable method of moving personnel and supplies.

For each African Union (AU) peacekeeping mission over the past decade, the AU has been required to engage in complex and lengthy negotiations with international partners to secure the airlift assets needed to transport African troops and material into and out of the AO. These delays often occur at the height of a crisis, precluding decisive action and putting civilian lives at increased risk. The African Union-United Nations Hybrid Operation in Darfur (UNAMID), for example, took nearly 2 years to reach just 68 percent of its mandated deployment levels due to stalled political negotiations and a lack of helicopter

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transport to support peacekeepers in remote regions of Darfur.<sup>1</sup>

Once deployed, the ability of African peacekeepers to carry out civilian protection mandates is severely limited by a lack of strategic and tactical airlift. UNAMID mission commanders have consistently reported an inability to defend civilians without helicopters to transport troops and equipment over Darfur's vast and difficult terrain.<sup>2</sup> During the rainy season, many roads in Darfur become impassible, severely curtailing peacekeepers' maneuverability and effectiveness.

Airlift resources are also needed to protect the lives of African peacekeepers. In July 2008, a UNAMID convoy was ambushed by armed militants for almost 3 hours, resulting in 7 deaths and 19 casualties. Without helicopters to stage a rescue or reinforcement mission, the convoy was left defenseless. Tactical airlift is needed to ensure that peacekeepers are, at a minimum, capable of providing security for themselves, a prerequisite for defending civilians.

United Nations (UN) Secretary-General Ban Ki-moon has similarly called for more helicopters in the DRC's Kivu region,<sup>3</sup> where a UN stabilization mission has struggled to prevent armed groups from targeting civilians in remote areas.

Insufficient airlift assets have also impeded African governments' ability to interrupt transnational crime, including piracy, illegal fishing, oil bunkering, toxic waste dumping, and illicit trafficking. Reports of piracy off the coast of Nigeria have more than doubled since 2011.<sup>4</sup> Moreover, piracy incidents off of Africa's west and east coasts often occur more than 70 nautical miles from shore, making them difficult to monitor using land- and sea-based surveillance equipment.

Africa's growing narcotics trafficking threat will be

difficult to halt without aircraft capable of detecting vessels on illicit transit routes. Estimates are that approximately 80 percent of cocaine traveling from Latin America to Africa moves by sea and the remaining 20 percent by air.<sup>5</sup> Without air assets to monitor these routes, transnational criminals will continue to make the apt calculation that African states are enabling environments for illicit activities.

Airlift is particularly important to Africa's security context given the geography of the continent. Africa represents one-fifth of the world's total land mass and is home to 30,490 kilometers (18,945 miles) of coastline, dense tropical areas, and expansive deserts, rendering land-based transportation an expensive and inefficient alternative to air travel. In short, airlift capacity is a strategic force multiplier for resource-constrained African security sectors.

## THE AU'S AIRLIFT VISION

Airlift capacity entails both strategic airlift to deliver troops and material to an AO, usually by large jet-powered aircraft, and tactical airlift to support operations thereafter, typically by turboprop aircraft and helicopters. Recognizing this and the scope of complex emergencies that it faces, the AU set the goal of establishing a Rapid Deployment Capability of the African Standby Force (ASF) in 2007 that would rely on airlift to deploy 2,500 personnel, including peacekeepers, police, and civilians, to a crisis within 30 days of an AU mandate.<sup>6</sup> Depending on the operational demands of a given crisis, this could be achieved with a mixture of airlift assets.

At the continental level, airlift platforms such as the Antonov An-124, Boeing C-17, and Ilyushin Il-76 (see table 1), which are capable of transporting equipment into and out of an AO for 1 brigade (approximately 3,000 troops), would be most efficient. Military airlifters are configured to transport equipment and palletized cargo more efficiently than passengers, so commercial aircraft are needed to transport personnel. This requires aircraft capable of carrying at least 1 company (130 troops) that can make multiple roundtrips in rapid succession.

At the subregional level, airlift capacity is needed to respond to crises and other transnational security challenges that exceed individual states' capacity, such as narcotics trafficking, stabilization operations, and major

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TABLE 1. FIXED-WING AIRLIFT PLATFORMS		
Aircraft	Approximate cost per aircraft	Specifications
Antonov An-124	\$30-32 Million	Max payload: 300,000 lbs Seating: 350 Notes: Large cargo aircraft capable of transporting heavy, oversized loads.
Boeing C-17 Globemaster III	\$202–270 million	Max payload: 164,900 lbs Seating: 134 Notes: Capable of rapid strategic delivery of troops and cargo to main operating bases or to forward bases.
Ilyushin Il-76	\$30–50 million	Max payload: 114,640 lbs Seating: 140 Notes: Designed to deliver heavy vehicles and machinery to remote, poorly-served airfields.
Airbus A400M	\$120–130 million	Max payload: 81,600 lbs Seating: 116 Notes: Capable of performing tactical airlift, long-range transport, and air-to-air refueling.
Lockheed C-130H	\$12–48 million	Max Payload: 42,000 lbs Seating: 92 Notes: Capable of operating from rough, dirt strips and airdropping troops and equipment.
EADS CASA C-295	\$24–35 million	Max payload: 20,400 lbs Seating: 71 Notes: Capable of rapid-response missions with cargo, equipment and soldiers, as well as medevac duties and airdrop delivery.
Embraer EMB 110 Bandeirante	\$1 million	Max takeoff weight: 12,500 lbs Seating: 18 Notes: General purpose light transport aircraft.
Hawker Beechcraft Super King Air 350	\$7 million	Max takeoff weight: 15,000 lbs Seating: 15 Notes: Modular craft commonly used for surveillance and reconnaissance.

Source: Cost and specifications vary by model, age, capabilities, and other customizations. Ranges listed are approximations gathered from *Jane's All the World's Aircraft*, military procurement records, and other databases.

natural disasters. This requires medium-sized aircraft such as the Airbus A400M and C-130 Hercules to transport 1 to 2 battalions (at least 1,500 personnel) and their equipment over medium distances on short notice, ideally 14 days.

Once in an AO, security forces require airlift support from helicopter systems, ideally large rotary-wing airlifters such as the CH-47 Chinook. Helicopters enable troops and equipment to be inserted into and extracted from rugged areas as well as provide ground units mobile aerial surveillance. Most fixed-wing aircraft, in contrast, require well-maintained runways and provide more transient, intermittent reconnaissance.

### “contemporary warfare in Africa rarely involves airspace challenged by an adversaries’ fighter aircraft”

At the national level, African states must be prepared to airlift troops and material for disasters, respond to localized crises before they escalate, patrol borders, monitor maritime areas as part of antipiracy and exclusive economic zone surveillance, and conduct evacuations. The ideal size of a national airlift fleet varies greatly according to a country’s geography, population,

and overall security environment. Smaller African states should at a minimum maintain the ability to transport a company-sized force anywhere within their territory in a single day. Larger African states or those that regularly face national security emergencies should be capable of transporting a battalion-sized force in the same time period, making successive roundtrip flights as needed. Platforms that meet these criteria include the C-130 Hercules, EMB 110 Bandeirante, CASA C-295, and small- or medium-sized helicopters such as the Mi-17, SA 330 Puma, and UH-60 Black Hawk (see tables 1 and 2).

“Low and slow” airlifters are well suited to the continent’s unconventional security threats and should be prioritized over costly attack aircraft that risk draining defense budgets of limited resources. Contemporary warfare in Africa rarely involves airspace challenged by an adversaries’ fighter aircraft, making attack and air defense systems virtually irrelevant. Instead, African countries must have the capacity to face threats posed by irregular forces.

At present, the majority of Africa’s air forces are not equipped with the needed spectrum of air systems and trained personnel to support national or regional mis-

TABLE 2. ROTARY-WING AIRLIFT PLATFORMS		
Aircraft	Approximate cost per aircraft	Specifications
Boeing CH-47SD/D Chinook	\$30–32 million	Max takeoff weight: 54,000 lbs Seating: 44 Notes: Capable of carrying cargo internally or sling loaded.
Mil Design Bureau Mi-17	\$17–20 million	Max takeoff weight: 25,000 lbs Seating: 35 Notes: Twin-turbine transport helicopter that can also act as a gunship.
Sikorsky UH-60 Black Hawk	\$10–21 million	Max takeoff weight: 21,884 lbs Seating: 12 Notes: Capable of transporting troops, equipment, and supplies.
Eurocopter AS332 Super Puma	\$16 million	Max takeoff weight: 18,959 lbs Seating: 24 Notes: Twin-engine, medium transport or utility helicopter.

Source: Cost and specifications vary by model, age, capabilities, and other customizations. Ranges listed are approximations gathered from *Jane's All the World's Aircraft*, military procurement records, and other databases.

sions. These emerging capacity air forces are comprised of aircraft that may be aging, out of service, or operated even when they do not meet the International Civil Aviation Organization's widely accepted safety standards. Such air forces face serious resource constraints, have limited access to specialized training, and have less developed air infrastructure, especially maintenance facilities.

Moderate capacity air forces in countries like Angola, Nigeria, and Tunisia have the ability to transport several companies of troops and heavy equipment around the entirety of their national territory and within their respective subregions. However, transporting troops and heavy payloads on a continent-wide scale would be slow and impractical. Their fleets are comprised of a variety of aircraft that are generally reliable, though some may be aging or out of service.

High capacity air forces in Algeria, Egypt, Morocco, and South Africa have the ability to transport large troop contingents and heavy equipment over long distances in short periods of time. Aircraft in these countries are regularly maintained and operated by highly trained personnel. Their air transport infrastructure, including runways, radar systems, and maintenance facilities, is modern and conducive to long-range airlift sorties.

To maximize its airlift capabilities, the AU is developing a Strategic Mobility Package (SMP) to coordinate transportation services (including and especially airlift) for the ASF. Although the AU would administer airlift operations, it would rely entirely on the assets of member states. The AU's objective is not to create its own standing air force but to assemble airlift resources from contributing member states and deploy them appropriately.

This requires the AU to secure airlift agreements from member states in advance, especially from high capacity airlift "anchor states." These agreements would specify the scope of a country's airlift support and would be activated via the AU mandating process. To ensure mission readiness, the SMP will need an airlift asset verification program to confirm the airworthiness and availability of assets pledged to AU missions. This program would function similarly to the certification of troops and equipment that support UN missions.

Like other Regional Economic Community (REC) and AU mechanisms, the success of the SMP will depend on member states' commitment to collective security and decisionmaking. The SMP's airlift activities would also require a functioning cost-sharing facility that enables airlift contributing countries to receive compensation for the use of their assets. Africa's airlift "anchor states" are natural choices for the provisions of airlift to AU missions. However, they cannot be expected to render airlift support without member states sharing the deployment cost.

#### Rwanda's Earthquake Response

In 2008, 2 powerful earthquakes with magnitudes of 6.1 and 5.0 struck Rwanda's southwest border, resulting in 37 deaths and over 600 injuries. The Rwanda Defence Force (RDF) immediately dispatched helicopters and airlifted earthquake victims to hospitals in the capital, Kigali. Helicopters were also employed to transport medical personnel to affected areas. RDF airlift operations were coordinated by the Rwandan Disaster Management Task Force, which also oversaw the distribution of food aid, water supplies, and medicine. Rwanda's response demonstrated how even modest levels of airlift capacity can yield significant results when paired with a well-coordinated strategy.

## CONSTRAINTS TO AIRLIFT DEVELOPMENT

Most African security structures remain overwhelmingly land-centric—legacies of their colonial and independence-movement origins. Altering these precedents requires deepening military planners' understanding of how airlift capacity amplifies the efficacy of ground forces by enabling troops to access remote territories quickly, extract troops from hostile environments, and receive supplies and heavy equipment in an AO. Conversely, ground forces with insufficient airlift support are slow to deploy and operationally constrained. Thus, while commonly viewed as too expensive, airlift capacity enables African militaries with limited resources to cover more territory for longer periods of time. Gabon and Cape Verde, for example, have employed light turboprop aircraft such as the Embraer EMB 110 Bandeirante to transport troops and conduct aerial surveillance over regions experiencing high levels of maritime and transborder trafficking. At a cost of about \$1 million per aircraft, such airlift platforms are an efficient means of expanding military effectiveness. African air forces are also leveraging light and medium airlift systems that have been discontinued such as the Russian-made Antonov An-24 and Dutch-made Fokker F27, both of which are inexpensive and reliable if adequately maintained.

**“while commonly viewed as too expensive, airlift capacity enables African militaries with limited resources to cover more territory for longer periods of time”**

Despite its strategic advantages, building political will for airlift systems is a serious challenge when the cost of larger, more sophisticated airlift platforms is taken into consideration. The AU's operating budget in 2011 was \$260 million, the approximate cost of just one Boeing C-17 transport jet. Procuring advanced airlift systems is a complex process that involves financing multimillion or even multibillion dollar agreements with manufacturers. In 2009, the South African Parliament cancelled its order of eight Airbus A400M aircraft as opposition grew in response to the system's rising costs, which exceeded the initially negotiated price of almost \$2.5 billion.

In addition to high costs, airlift platforms need support over the long term. The lifecycle cost of airlift systems, including maintenance, fuel, and crew expenses, often exceeds the initial purchase price of individual aircraft. Overlooking these costs has resulted in aircraft that are frequently out of service or operated while failing to meet safety standards.

The long-term cost of maintaining airlift systems is further compounded by the diversity of African air force fleets. African air forces include assets manufactured in former colonial powers, Eastern Europe, Brazil, and the United States, all of which have discrete maintenance requirements. This has led African air forces to outsource maintenance work to African countries with high capacity air forces or to overseas partners.

The steep cost of quality flight training is a further impediment to building African airlift capacity. African pilots, crews, and technicians are trained mainly by Africa's high capacity air forces, while others receive training in Europe and the United States. These overseas training opportunities are limited, however, and may not correspond to the diverse equipment of African air forces, necessitating a second round of training when African pilots and crew members return to their home countries.

Airlift capacity development has also been hindered by a shortage of air transport infrastructure such as air traffic control facilities and navigational aids, among other components. Air-to-ground communication is one of the continent's most pressing needs. Aircraft can fly for more than an hour in parts of Africa without being able to communicate with ground control.<sup>7</sup> These factors have combined to make Africa the continent with the poorest air safety record in the world, with an average of 4.31 aircraft losses per million departures, compared to 0.65 worldwide.<sup>8</sup>

## PRIORITIES FOR AIRLIFT DEVELOPMENT

Addressing Africa's immediate security concerns while simultaneously building long-term airlift capacity requires African states, RECs, and the AU to advance a combination of measures.

**Build African airlift partnerships.** African states possessing advanced airlift capabilities, namely Algeria, Egypt, Morocco, and South Africa, are capable of serving as pillars for bilateral partnerships thanks to their advanced

air fleets. Providing leadership for airlift partnerships offers these countries an opportunity to promote stability in their respective subregions and to shape the development of airlift on the continent more broadly. They also stand to develop more specialized airlift systems, air maintenance facilities, and flight schools as neighboring countries draw on them for support.

Airlift partnerships should involve pooling assets, conducting joint exercises, sharing maintenance facilities, and providing support to a partner country. Among other advantages, shared maintenance facilities enable African states to keep their air assets flying safely for longer, effectively extending their capacity at a fraction of the cost of purchasing new planes. Several African air forces are already seizing the opportunities that bilateral partnerships offer, such as the Senegalese and Royal Moroccan Air Forces, which have successfully collaborated on training exchanges and maintenance activities. Algeria and Burkina Faso have a similar air partnership.

Nevertheless, such partnerships occur too infrequently. This fact stems in part from the reluctance of neighboring countries to exchange information about their air force capabilities. Building African airlift capacity is as much a matter of building trust as it is securing financial resources for airlift investments. One way to address this challenge is to start with modest airlift partnerships that are then expanded to support regional efforts over time.

***Pool airlift resources within the AU and RECs.*** To overcome air domain constraints, the AU and RECs should emulate air partnership models such as NATO's Strategic Airlift Capability initiative, in which a consortium of 10 NATO countries plus 2 partner countries have purchased and share 3 Boeing C-17 strategic transport aircraft. NATO members have also pooled resources to form the Strategic Airlift Interim Solution (SALIS), a cooperative agreement that maintains two Antonov An-124-100 aircraft on fulltime charter. The SALIS agreement is also capable of dispatching two additional An-124-100 aircraft on 6 days' notice and another two on 9 days' notice. NATO's pooling initiatives have enabled member states to share the high costs of needed airlift systems and deploy airlift assets to a variety of missions and locations.

***Build capacity by collaborating with external partners.*** External partners, mainly in the United States and Europe, have demonstrated a willingness to partner bilaterally

with African air forces and offer a variety of capacity-building and procurement programs. The U.S. Department of Defense provides partner countries with access to its Foreign Military Sales, Foreign Military Financing, and Excess Defense Articles programs, which can be leveraged to finance and procure needed airlift systems. The Botswana Defence Force, for example, successfully purchased C-130B transport aircraft using the Foreign Military Sales program. These programs have also been used to procure smaller turboprop aircraft such as the Beechcraft Super King Air 350, used for light airlift and surveillance. Many African air forces also operate European aircraft procured via security assistance programs and receive specialized training and maintenance services from European partners.

A recurring weakness of external bilateral support, however, is its tendency to be episodic, creating planning and coordination challenges for African air chiefs. Crafting more formal security cooperation agreements that center on shared interests can help to promote consistency. These agreements should emphasize Africa's airlift capacity development over other assets such as expensive and less useful attack aircraft.

***Streamline airlift agreements with international organizations.*** To strengthen air support to future peacekeeping missions, the AU should strengthen its relationship to the UN. The UN's Department of Peacekeeping Operations has been a key partner in securing airlift resources for joint missions in Africa, such as in Darfur with UNAMID. Despite this partnership, AU-UN collaboration has been suboptimal due to communication gaps and disagreements over mission mandates. To improve this partnership—a task that both organizations recognize is needed—the UN and AU should consider adopting a strategic framework for airlift operations.

The AU should also strengthen its relationship with NATO to secure needed airlift in the near term. NATO has the capacity to transport multiple brigade-sized forces to hostile environments and provide sustained airlift over the life of a peacekeeping mission. During the AU Mission in Sudan, NATO coordinated the airlift of 31,500 troops and personnel into and out of Darfur. Airlift support from NATO has also been vital to the deployment of Burundian and Ugandan troops to Somalia in support of AMISOM and its 17,000 personnel. The AU's Peace and Security Council and its Peace Support Operations Division have



expressed eagerness to expand cooperation with NATO on future peacekeeping deployments. This is a step in the right direction, and should be reinforced by additional efforts to streamline AU-NATO collaboration.

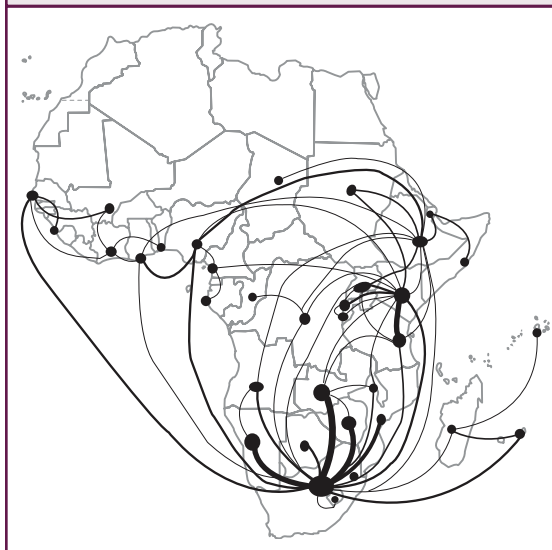
**Engage the private sector.** The private sector has a critical role to play in providing strategic airlift to African security operations. Even the world's leading air forces rely on commercial airlines to provide airlift for large-scale operations. NATO countries regularly transport personnel and equipment using privately chartered flights and the U.S. maintains the Civil Reserve Air Fleet (CRAF), a consortium of U.S. commercial air carriers that can be called upon to provide airlift services to the U.S. military in an emergency. European, Asian, and South American air forces also use private sector air carriers to transport troops and equipment to crisis situations.

At present, there is untapped potential for public-private partnerships to fill Africa's airlift gap. Africa's commercial air industry is led by efficient air carriers such as EgyptAir, Ethiopian Airlines, Kenya Airways, Royal Air Maroc, and South African Airways. The AU, RECs, and individual African states should establish relationships with these carriers to secure vital airlift capacities for security operations as well as reinforce the profitability of Africa's commercial air industry. African policymakers may also consider contracting with non-African commercial airlines, which have proven their ability to operate safely and at low cost on the continent.

A prevailing challenge when recruiting support from commercial air carriers is the high cost of insurance premiums for aircraft landing in an AO. The AU can help minimize this cost by negotiating better collective rates with insurance providers and by creating a fund to cover all or a portion of war-risk insurance premiums. An example that the AU might consider is the Aviation War Risk Insurance Program managed by the U.S. Federal Aviation Administration, which provides reasonably priced insurance coverage for losses due to war, capture, vandalism, and other conflict-related damages.

Air traffic in Africa has surged over the past decade and is projected to grow at a rate of 5.7 percent per year, significantly faster than the international average of 4.9 percent.<sup>9</sup> Platforms such as CASA C-295s, C-130s, and larger airlifters frequently depend on the same air infrastructure that commercial air traffic utilizes, such as run-

**FIGURE 1. TOP 60 AIR ROUTES WITHIN SUB-SAHARAN AFRICA**



Source: Bofinger 2009.<sup>10</sup> The thickness of the lines is on a continuous scale, with the thickest line (South Africa-Zambia) representing nearly 1 million seats for 2007 and the thinnest (Ethiopia-Ghana) representing 62,000 seats. The size of the end points results from the thickness of the lines.

ways, fueling stations, maintenance facilities, radar, and other secondary air systems, so growth in the commercial sector augurs well for Africa's airlift capacity deficit.

Nevertheless, subregional disparities have emerged, with booming air hubs in Southern and Eastern Africa and significantly less commercial air traffic in Central and Western Africa (see figure 1). To build airlift capacity in countries and regions with less developed air transport industries, therefore, African security officials should support civilian counterparts' efforts to implement cooperative agreements created to sustain commercial air industry growth. One such measure is the Yamoussoukro Decision, an agreement signed in 2000 and ratified by 48 African states by 2004. Implementation of this expansive technical framework, which stipulates the liberalization of air services, broadening of air traffic rights, and reductions in tariffs, has underpinned Africa's booming air transport industry but remains uneven and incomplete.<sup>11</sup> The African Civil Aviation Commission's ongoing efforts to realize full application of the Yamoussoukro Decision and develop an integrated air transport system on the continent are vital to building African airlift capacity.

**Inventory existing African airlift assets.** Information gaps are obstructing African policymakers from optimizing air partnerships and making judicious procurement deci-



sions. Sharing information about African airlift fleets, their airworthiness, and the availability of spare parts would create opportunities for African air forces with similar air assets to collaborate. This would also allow African countries to avoid procuring redundant systems or aircraft that pose interoperability challenges when conducting joint operations.

The AU has stated the need to develop a database of the continent's airlift platforms for the purpose of standing up its SMP.<sup>12</sup> Like other security cooperation activities, however, this priority is challenging due to member states' concerns that information about their strategic capabilities will be used against them. More subtly, some AU member states are reticent to divulge the true extent of their limited airlift capabilities. Overcoming these concerns is a long-term project that the AU should undertake by demonstrating the advantages of information sharing and airlift cooperation. Conversely, the AU need not oblige member states to share information about all air systems, such as fighter aircraft, missile systems, or other sensitive capacities. The AU should rather compile a limited and targeted database of workhorse airlift platforms and spare parts.

The AU can also build momentum for its information-sharing efforts by emphasizing existing bilateral and subregional security cooperation agreements. Airlift information sharing between countries that are already cooperating will be easier to establish than information-sharing agreements between states that interact infrequently or not at all. Their willingness to share information about their airlift systems will set a powerful example for the rest of the continent.

## NOTES

<sup>1</sup> *Report of the Secretary-General on the deployment of the African Union-United Nations Hybrid Operation in Darfur* (UN Security Council: S/2009/352, July 13, 2009).

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<sup>6</sup> African Union, Specialized Technical Committee on Defense, Safety and Security, 4th Meeting, *Progress Report on the Status of the Operationalization of the African Standby Force* (Addis Ababa: AU, December 3-7, 2010). Jakkie Cilliers, *The African Standby Force: An Update on Progress*, ISS Paper 160 (Pretoria: Institute for Security Studies, March 2008).

<sup>7</sup> "Airport Runways and Terminal Capacity Are Generally Adequate, but Air Traffic Control and Surveillance Facilities Need Substantial Improvement," African Development Bank, available at <[www.infrastructureafrica.org/key-msg/sector/airport-runways-and-terminal-capacity-are-generally-adequate-air-traffic-control-and-](http://www.infrastructureafrica.org/key-msg/sector/airport-runways-and-terminal-capacity-are-generally-adequate-air-traffic-control-and-)>.

<sup>8</sup> "A Poor Safety Record—Largely Attributable to Low Standards and Lax Supervision—Is the Greatest Challenge Facing the Air Transport Industry in Africa Today," African Development Bank available at <[www.infrastructureafrica.org/key-msg/sector/poor-safety-record%E2%80%94largely-attributable-poor-safety-standards-and-lax-supervision%E2%80%94](http://www.infrastructureafrica.org/key-msg/sector/poor-safety-record%E2%80%94largely-attributable-poor-safety-standards-and-lax-supervision%E2%80%94)>.

<sup>9</sup> Charles Schlumberger, *Open Skies for Africa: Implementing the Yamoussoukro Decision* (Washington, DC: The World Bank, 2010).

<sup>10</sup> Heinrich C. Bofinger, "An Unsteady Course: Challenges to Growth in Africa's Air Transport Industry," in *Africa Infrastructure Country Diagnostic*, ed. Vivien Foster and Cecilia Briceño-Garmendia (Washington, DC: The World Bank, July 2009), 261.

<sup>11</sup> Schlumberger.

<sup>12</sup> African Union, 2010.

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